

## ABSTRACT

An optical amplifier employing a rare earth-doped fiber (1) as an amplification medium and including an input monitoring unit (2a, 3a) that monitors full input light and outputs an input monitor signal and an output monitoring unit (2b, 3b) that monitors full output light and outputs an output monitor signal includes an ASE compensating circuit (7) that compensates for a spontaneous emission (ASE) component contained in the full output light monitor signal; a gain-variation-level compensating circuit (9) that calculates a target average setup gain that is determined based on a signal intensity of the input monitor signal; and a constant gain control circuit (8) that performs a gain control based on an output signal from the ASE compensating circuit (7) and the target average setup gain from the gain-variation-level compensating circuit (9).